

Kelita (Amaranthaceae), a new genus from Queensland, Australia

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Introduction

Amaranthaceae is well represented in Australia. The largest genera are *Ptilotus* R.Br. (c. 100 species), *Gomphrena* L. (31 indigenous species), *Amaranthus* L. (11 indigenous species) and *Alternanthera* L. (c. 6 indigenous species). There is no recent revisionary account for *Ptilotus* or *Alternanthera*, but *Gomphrena* (Palmer 1998) and *Amaranthus* (Palmer 2009) have recent treatments for Australian species. There are only three existing endemic Australian genera, namely *Hemichroa* R.Br. (3 species), *Nyssanthes* R.Br. (2 species) and the recently named monotypic genus *Omegandra* G.J. Leach & C.C. Towns.

The genus described here belongs to the Subfamily Amaranthoideae (based on the bilocular anthers), and the Subtribe Aervinae Endl. (based on the pendulous ovule). It is closely allied to both *Ptilotus* and *Omegandra*. Some of the distinctive features of the new genus are the denticulate leaves, the zygomorphic flowers and the uncinata awns present on all tepals.

Townsend (1993) provided an excellent synopsis of the family worldwide, including a brief description of all genera, a key to the genera, and a discussion of the major characters used to distinguish the genera, subtribes and tribes.

Taxonomy

Kelita A.R.Bean gen. nov.

a Ptiloto floribus zygomorphis tepalis uncinatis et staminibus perfectis duobus tantum, ab Omegandra floribus zygomorphis tepalis quinque uncinatis et ab ambobus foliis denticulatis et fructibus parietibus crassis dignoscenda.

Annual herbs; stems prostrate, longitudinally striate. Leaves alternate, exstipulate. Inflorescences axillary, spicate. Flowers solitary in bract, bibracteolate, all fertile, hermaphrodite, zygomorphic; tepals 5, all similar, densely lanate on outer surface. Fertile stamens 2, pseudostaminodes absent; anthers bilocular (4-locellate). Ovary superior, unilocular, uniovulate, placentation basal, ovule pendulous. Style simple, centrally attached; stigma not lobed, not capitate. Fruits indehiscent, hard, thick-walled.

Type: *Kelita uncinella* A.R.Bean

Abstract

A new genus in the family Amaranthaceae, *Kelita* A.R.Bean is described. The new genus belongs to Subtribe Aervinae Endl. and is related to *Ptilotus* R.Br. and *Omegandra* G.J. Leach & C.C. Towns. It differs from these genera by the denticulate leaf margins, the zygomorphic flowers, the uncinata awns on the tepals, and the thick-walled fruits. The genus comprises one species, *K. uncinella* A.R.Bean, which is described and illustrated. It is highly geographically restricted, and a conservation status of 'Endangered' is recommended.

Keywords: taxonomy, Australian flora, endangered species.

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***Kelita uncinella* A.R.Bean sp. nov.**

Herba prostrata foliis alternis denticulatis, inflorescentiis spicatis axillaribus, floribus sessilibus zygomorphis staminibus duobus perfectis, tepalis uncinatis dense lanatis et capsula lenticulari parietibus crassis praedita.

Type: Queensland. SOUTH KENNEDY: 3 km (direct) NW of haul road overpass, near Newlands Coal Mine, WNW of Glenden, 8.vi.2009, A.R. Bean 29009 (holotype: BRI (1 sheet + spirit); isotypes: CANB, E, K, L, MEL, NY, PRE, Z, to be distributed).

Prostrate annual herb with numerous stems radiating from a central rootstock; stems up to 1.2 m long, longitudinally striate, glabrescent, not rooting at the nodes. Juvenile plants with leaves opposite for 2 or 3 pairs, then alternate. Mature plants with leaves alternate, ovate to rhomboid, glabrous, petioles absent or up to 12 mm long; laminae 30–70 mm long, 13–30 mm wide, dark green above, paler below, midvein conspicuous, raised on underside, secondary veins penninerved, easily visible on underside; margins denticulate, with 20–100 teeth on each side, each 0.1–0.2 mm long; base attenuate, apex acute to mucronulate. Inflorescences spicate, sessile, axillary, solitary or branched, cylindrical, 7–27 mm long; rachis densely pubescent, with tangled uniseriate hairs. Bracts 1 per flower, narrowly-ovate, 1.5–2 × 0.7–0.8 mm, membranous, hyaline, glabrous, with a prominent midrib, apex acuminate, persistent on rachis; bracteoles 2 per flower, ovate, 2.4–2.8 × 1–1.5 mm, membranous, hyaline, glabrous, keeled, with a prominent midrib, apex acuminate, persistent on rachis. Pedicels absent. Flowers zygomorphic, dorso-ventrally flattened, long axis perpendicular to rachis, bracteoles at either end of long axis. Tepals 5, free to base, apparently never opening widely, all similar in size, shape and indumentum, comprising tepal body and narrow terminal awn; tepal body narrowly oblong to narrowly elliptic, 2.3–2.8 mm long, 0.4–0.5 mm wide, herbaceous with scarious margins; dorsal surface with very dense tangled, woolly, simple, pale brown hairs, obscuring an otherwise conspicuous midrib; ventral surface stramineous, without veins, glabrous; terminal awn 0.3–0.8 mm long, slender, glabrous, apex uncinulate. Staminal cup membranous, hyaline, c. 0.4 mm high; perfect stamens 2, staminodes 3 with anthers completely lacking; filaments slender, 0.6–0.8 mm long; anthers white, 0.2–0.3 mm long. Ovary sessile,

broadly lenticular, 0.8–1 mm long at anthesis, glabrous; style straight, tapering, 0.4–0.6 mm long, glabrous; stigma not expanded, not lobed. Fruits lenticular, c. 1.5 mm diameter excluding style, stramineous to brown, 1-seeded, thick-walled, indehiscent, style persistent. Seed lenticular, completely filling fruit cavity, c. 1.1 mm diameter, with a thin brown crustaceous integument. Figs. 1–2.

Specimens examined: QUEENSLAND. SOUTH KENNEDY: 2 km W of Newlands Access road, Newlands Mine, NW of Glenden, 2.iv.2009, R. Hendry & K. Wormington RH068 (BRI); 3 km (direct) NW of haul road overpass, near Newlands Coal Mine, WNW of Glenden, 8.vi.2009, A.R. Bean 29013 (BRI, NSW); 600 metres N of Glenden-Collinsville road, 3.6 km from Newlands turnoff, 9.vi.2009, A.R. Bean 29051 (BRI); ditto, A.R. Bean 29052 (BRI, CNS, DNA).

Distribution and habitat: *Kelita uncinella* is known only from the vicinity of the Newlands coal mine about 130 km west of Mackay in Queensland. It grows on the slopes of tertiary plateaux (or 'jump-ups'), appearing to prefer south-facing slopes. The vegetation is a woodland of *Acacia shirleyi* Maiden, with 'scrub' elements in the understorey, e.g. *Erythroxylum australe* F.Muell., *Croton insularis* Baill., *Acalypha eremorum* Müll. Arg. and *Grevillea helmsiae* F.M.Bailey. The grassy ground layer is rather sparse, with *Ancistrachne uncinulata* (R.Br.) S.T.Blake, *Paspalidium* sp. or *Leptochloa decipiens* (R.Br.) Stapf ex Maiden. The shallow soil is a pink, gravelly loam.

Phenology: Flowers and fruits are recorded from April to June, but the phenology remains poorly known.

Affinities: *Kelita* is closely related to *Ptilotus* and *Omegandra*, and the differences are summarised in Table 1. The leaf margins of *Kelita* are inconspicuously (but consistently) denticulate, a feature relatively uncommon in the family, and not found in either *Ptilotus* or *Omegandra*. Very few species of *Ptilotus* have their inflorescences sessile in the axils of fully developed leaves; those that do (e.g. *P. murrayi* F.Muell.) have other characteristics that are typical of *Ptilotus*.

The flowers of *Kelita* are zygomorphic, more specifically dorsoventrally flattened, with a bracteole at each end of the long axis. This flattening can be observed in young flowers near the apex of the inflorescences, as soon as the developing perianth emerges from between the bracteoles, and persists to the fruiting stage. At no time do the tepals appear to open widely as they do in *Ptilotus* and *Omegandra*.



Figure 1: *Kelita uncinella*: A. flowering branchlet $\times 0.8$; B. flowering spikes $\times 6$; C. flower $\times 12$; D. Stamens and staminal cup $\times 24$; E. ovary, style, stamens and staminal cup $\times 24$; F. perfect stamen $\times 24$; G. Seed $\times 24$; H. Bract and bracteoles $\times 12$. All from Bean 29009.

In both of those genera, flowers are actinomorphic. The tepals are consistently five in *Kelita*, providing a strong contrast to the 4-tepaled flowers of *Omegandra*. The tepals of *Kelita* have a stout conspicuous midrib (although normally obscured by indumentum), while the midrib in the other genera is relatively obscure. In *Kelita*, all of their tepals have a terminal awn with an

uncinate apex; uncinate tepal apices are unknown in *Ptilotus* or *Omegandra*, although this feature is found elsewhere in the family, e.g. the outer tepals of *Cyathula* spp.

The number of perfect stamens in *Kelita* is always two, as in *Omegandra*. The stamen number for the large genus *Ptilotus* varies between species, but the most



Figure 2: A. Mature healthy plant of *Kelita uncinella* in natural habitat.

B. Flowering branchlet of *Kelita uncinella* in natural habitat.

common number is five. Pseudostaminodes are absent in *Kelita*, while they are frequently present in *Ptilotus*. The stigma of *Kelita* is unexpanded and unlobed, while that of *Omegandra* is shortly bilobed and *Ptilotus* stigmas are

capitate (expanded in comparison with the style). The fruits of *Kelita* are completely indehiscent, with a thick hard pericarp surrounding the seed, whereas the fruits of *Ptilotus* and *Omegandra* have a very thin membranous pericarp, which ruptures very easily.

Notes: The small hooks on the tepals of *Kelita uncinella* have presumably evolved as an aid to seed dispersal. The tepals and the capsule remain firmly attached to each other in the aging flower. Together they form the propagule, which readily detaches from the bract and bracteoles. I have observed that the propagules will attach themselves weakly to clothing, and hence presumably to animal fur, and could be transported for some metres before being dislodged. However, the hooks of *K. uncinella* are far less efficient for dispersal than those of some other local species, e.g. *Ancistrachne uncinulata* (Hooky grass).

Conservation status: *Kelita uncinella* is currently known from two sites about six kilometres apart. Fifty to one hundred plants were located at the site where the type specimen was collected, while at the other site, approximately 200 plants were present. Both sites are within 50 metres of cleared paddocks, but the steepness and infertility of the *Kelita* sites have prevented clearing there. Two weed species are presently associated with *K. uncinella* at the known sites, namely *Pennisetum ciliare* (L.) Link (Buffel Grass) and *Salsola tragus* L. (Roly Poly), but neither is common. The main threats are continued weed incursion and mining development.

Kelita uncinella is an annual plant and hence is present only after suitable rainfall and/or seasonal conditions.

Table 1. Comparison of *Ptilotus*, *Omegandra* and *Kelita*.

	<i>Ptilotus</i>	<i>Kelita</i>	<i>Omegandra</i>
Leaf margins	entire	denticulate	entire
Inflorescence position	mostly terminal, pedunculate; in a few species sessile, axillary.	sessile, axillary	sessile, axillary
Flower symmetry	actinomorphic	zygomorphic	actinomorphic
Tepal number	5	5	4
Tepal midrib	obscure	prominent	obscure
Tepal apices	acute, erose or obtuse	uncinate	acute
Number of perfect stamens	mostly 5, sometimes 4 or 3, rarely 2	consistently 2	consistently 2
Pseudostaminodes	often present	absent	absent
Stigma	not lobed, usually capitate	not lobed, unexpanded	bilobed
Fruit wall (pericarp)	thin, membranous, easily ruptured	thick, hard, persistent	thin, membranous, easily ruptured

Such plants are under-represented in herbaria, and are usually more common and widespread than herbarium records indicate. For this species however, the total lack of previous collections would suggest that it is either very geographically restricted, or that it needs extraordinary climatic conditions to trigger the germination and establishment of plants.

In accordance with the Red List criteria (IUCN 2001), a conservation status of 'Endangered' is recommended (EN C1 2a(ii)).

Etymology: The generic name *Kelita* is a biblical name meaning dwarf, small or crippled, and is given in reference to the stature of the plant. The specific epithet is derived from the Latin *uncinatus* meaning 'with hooks', and the diminutive suffix *-ella*. This is in reference to the small hooks on the tepal apices.

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